



LACKAWANNA STEEL SHEET PILING



Catalog 120

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

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LACKAWANNA STEEL SHEET PILING

Straight-Web, Arched-Web, Deep-Arch



Catalog 120

BETHLEHEM STEEL COMPANY

General Offices

BETHLEHEM, PA.



NOTICE

This Catalog describes all of the Lackawanna Steel Sheet Piling sections now rolled and supersedes all previous issues.

Attention is directed to a new Arched-Web section, No. AP16 and to the new profile of Straight-Web section, No. SP15.

All Lackawanna Steel Sheet Piling sections are manufactured from open-hearth steel exclusively. Our special piling specifications provide the degree of hardness and tensile strength that experience has proven necessary for steel sheet piling.

Copper bearing steel can be furnished when required at slight additional cost.

All Steel Sheet Piling Sections, Rolled corners and Fabricated connections shown herein, may have an allowable variation of $2\frac{1}{2}$ per cent either way from the nominal weight, but are charged or billed at the catalog weights.

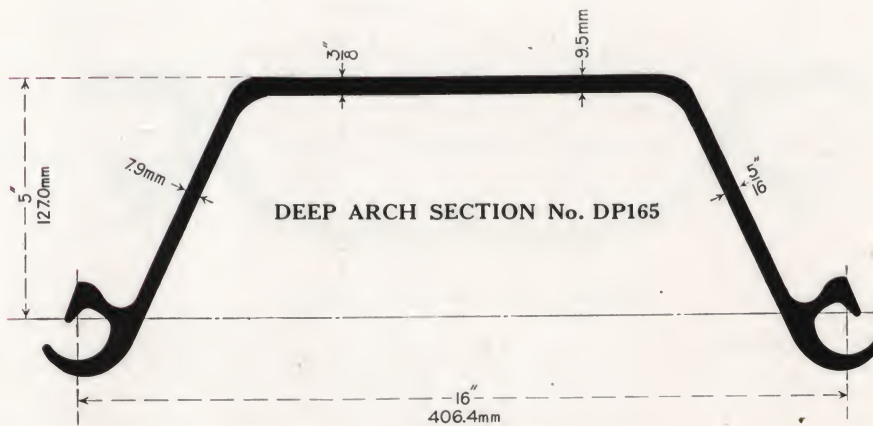
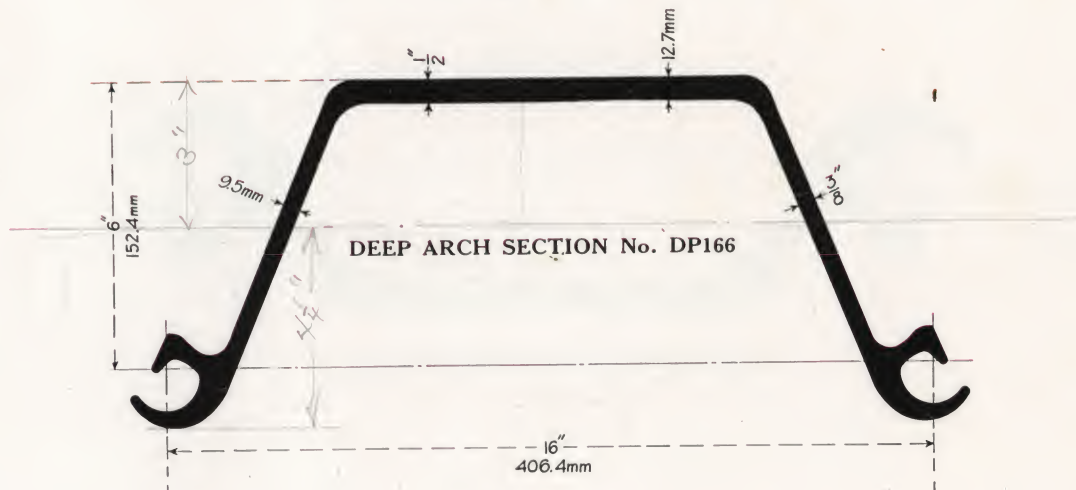
Further information on these sections and prices will gladly be furnished on request to our nearest district office.

BETHLEHEM STEEL COMPANY.

Bethlehem, Pa.
May, 1929.

DEEP ARCH SECTIONS

Scale 3" = 12"



| SECTION NUMBER | Size of Pile, Inches | Thickness of Web, Inches | WEIGHT IN POUNDS | | WEIGHT IN KILOGRAMS | | *SECTION MODULUS | |
|----------------|----------------------|--------------------------|------------------------|-------------------------|-------------------------|--------------------------|------------------|-------------------------|
| | | | Per Lineal Foot of Bar | Per Square Foot of Wall | Per Lineal Meter of Bar | Per Square Meter of Wall | Single Section S | Per Lineal Foot of Wall |
| DP166 | 16 | 1/2 | 42.6 | 32.0 | 63.4 | 156.0 | 20.28 | 15.21 |
| DP165 | 16 | 3/8 | 33.3 | 25.0 | 49.6 | 122.0 | 13.42 | 10.07 |

* For discussion of Section Modulus, see page 7.

PLAN SHOWING PILES INTERLOCKED IN WALL

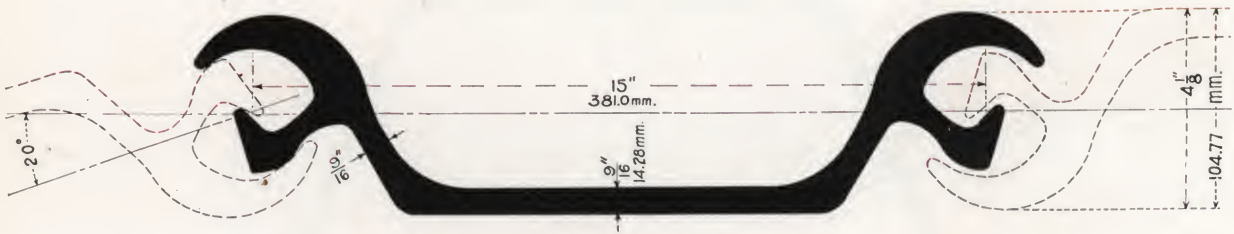




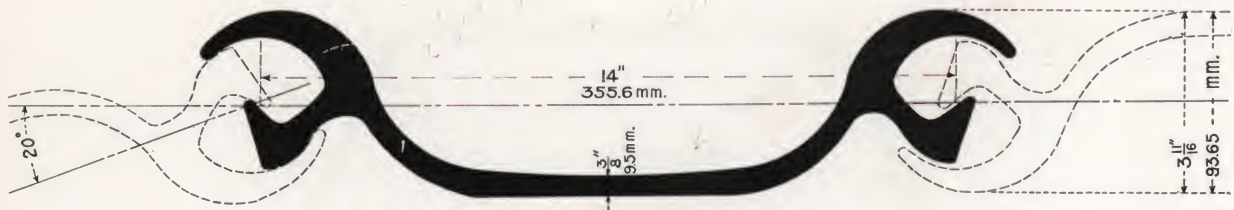
BETHLEHEM STEEL COMPANY

ARCHED-WEB SECTIONS

Scale 3" = 12"



ARCHED-WEB SECTION No. AP15



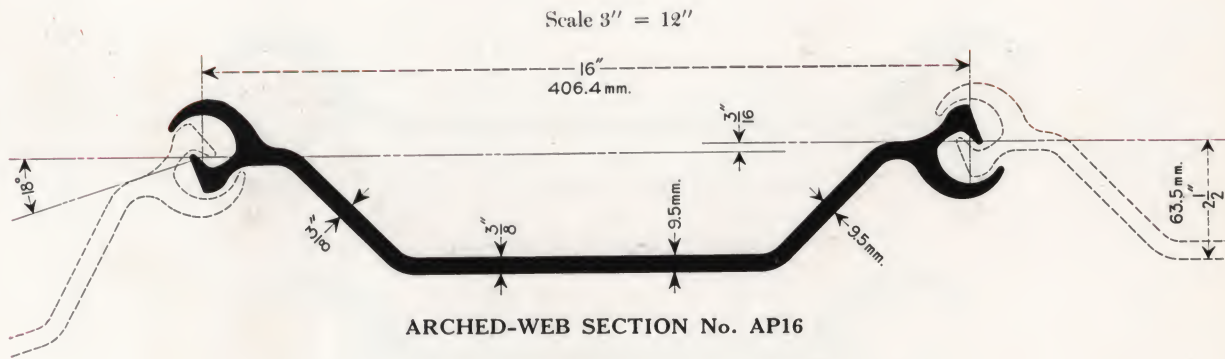
ARCHED-WEB SECTION No. AP14

| SECTION NUMBER | Size of Pile, Inches | Thickness of Web, Inches | WEIGHT IN POUNDS | | WEIGHT IN KILOGRAMS | | SECTION MODULUS | |
|----------------|----------------------|--------------------------|------------------------|-------------------------|-------------------------|--------------------------|------------------|-------------------------|
| | | | Per Lineal Foot of Bar | Per Square Foot of Wall | Per Lineal Meter of Bar | Per Square Meter of Wall | Single Section S | Per Lineal Foot of Wall |
| AP15 | 15 | $\frac{9}{16}$ | 58.1 | 46.5 | 86.5 | 227.0 | 11.86 | 9.49 |
| AP14 | 14 | $\frac{3}{8}$ | 40.8 | 35.0 | 60.8 | 170.9 | 7.61 | 6.52 |



ARCHED-WEB SECTIONS

(Continued)



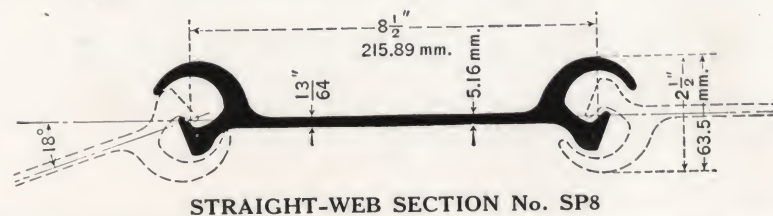
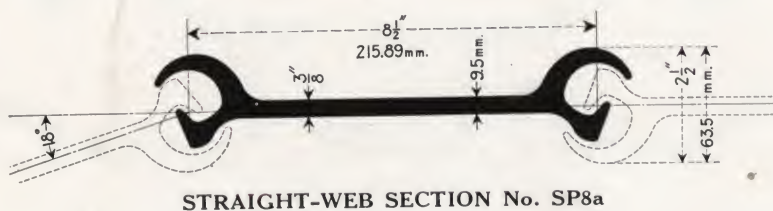
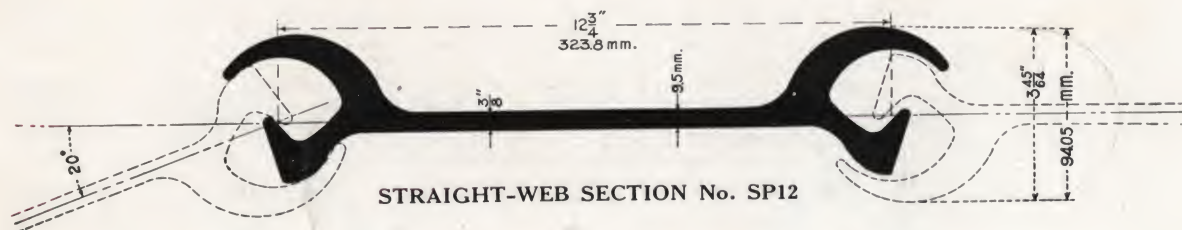
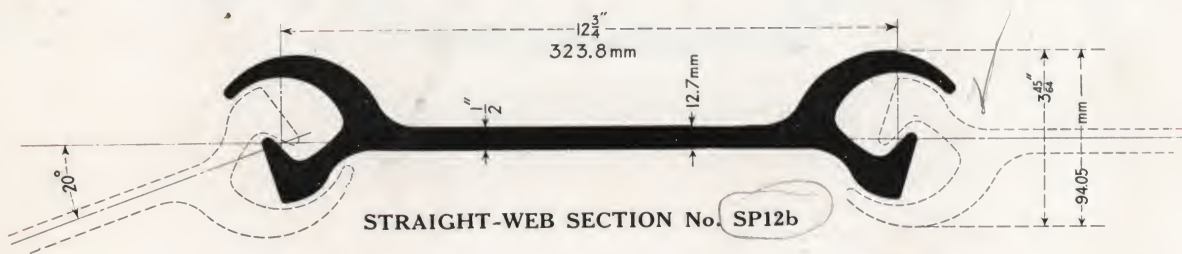
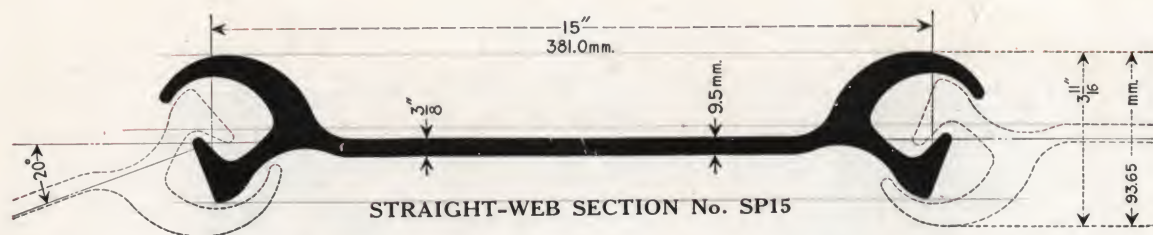
| SECTION NUMBER | Size of Pile, Inches | Thickness of Web, Inches | WEIGHT IN POUNDS | | WEIGHT IN KILOGRAMS | | SECTION MODULUS | |
|----------------|----------------------|--------------------------|------------------------|-------------------------|-------------------------|--------------------------|------------------|-------------------------|
| | | | Per Lineal Foot of Bar | Per Square Foot of Wall | Per Lineal Meter of Bar | Per Square Meter of Wall | Single Section S | Per Lineal Foot of Wall |
| AP16 | 16 | $\frac{3}{8}$ | 29.3 | 22.0 | 43.6 | 107.4 | 4.87 | 3.65 |



Note how this arrangement of piling forms a narrow wall with all webs lying in the same plane. This results in economy of space, a minimum of waste excavation and a saving of concrete when poured against the piling wall.

STRAIGHT-WEB SECTIONS

Scale 3" = 12"



| SECTION NUMBER | Size of Pile, Inches | Thickness of Web, Inches | WEIGHT IN POUNDS | | WEIGHT IN KILOGRAMS | | SECTION MODULUS | |
|----------------|----------------------|--------------------------|------------------------|-------------------------|-------------------------|--------------------------|------------------|-------------------------|
| | | | Per Lineal Foot of Bar | Per Square Foot of Wall | Per Lineal Meter of Bar | Per Square Meter of Wall | Single Section S | Per Lineal Foot of Wall |
| SP15 | 15 | 3/8 | 38.4 | 30.7 | 57.1 | 149.9 | 3.97 | 3.17 |
| SP12b | 12 3/4 | 1/2 | 40.9 | 38.5 | 60.9 | 188.0 | 4.02 | 3.78 |
| SP12 | 12 3/4 | 3/8 | 37.2 | 35.0 | 55.4 | 170.9 | 4.00 | 3.77 |
| SP8a | 8 1/2 | 3/8 | 17.8 | 25.1 | 26.5 | 122.6 | 1.10 | 1.55 |
| SP8 | 8 1/2 | 13/64 | 14.7 | 20.8 | 21.9 | 101.3 | 1.10 | 1.55 |



PROPERTIES OF LACKAWANNA STEEL SHEET PILING

| SECTION NUMBER | Size, Inches | Weight in Pounds Per Lineal Foot of Bar | Weight in Pounds Per Square Foot of Wall | Area of Section, Square Inches | Moment of Inertia, Inches ⁴ I | Single Section Modulus, Inches ³ S | Least Radius of Gyration, Inches R $R = \sqrt{\frac{I}{A}}$ | Section Modulus Per Lineal Foot of Wall, Inches ³ |
|----------------|------------------|---|--|--------------------------------|--|---|--|--|
| DP166 | 16 | 42.6 | 32.0 | 12.54 | 85.98 | 20.28 | 2.62 | 15.21 |
| DP165 | 16 | 33.3 | 25.0 | 9.80 | 48.99 | 13.42 | 2.24 | 10.07 |
| AP16 | 16 | 29.3 | 22.0 | 8.63 | 11.05 | 4.87 | 1.13 | 3.65 |
| AP15 | 15 | 58.1 | 46.5 | 17.09 | 28.78 | 11.86 | 1.30 | 9.49 |
| AP14 | 14 | 40.8 | 35.0 | 12.01 | 15.88 | 7.61 | 1.15 | 6.52 |
| SP15 | 15 | 38.4 | 30.7 | 11.30 | 6.15 | 3.97 | 0.74 | 3.17 |
| SP12b | 12 $\frac{3}{4}$ | 40.9 | 38.5 | 12.03 | 6.33 | 4.02 | 0.73 | 3.78 |
| SP12 | 12 $\frac{3}{4}$ | 37.2 | 35.0 | 10.94 | 6.32 | 4.00 | 0.76 | 3.77 |
| SP8a | 8 $\frac{1}{2}$ | 17.8 | 25.1 | 5.23 | 1.12 | 1.10 | 0.48 | 1.55 |
| SP8 | 8 $\frac{1}{2}$ | 14.7 | 20.8 | 4.32 | 1.12 | 1.10 | 0.51 | 1.55 |

SECTION MODULUS

The Section Modulus given in this bulletin for each of the various piling sections is that of a single or separate section about the neutral axis through its center of gravity.

Sometimes it is assumed that a number of piling sections joined by interlocking the ends of their legs develop a strength equal to that of the combined sections, due to a so-called "interlocked" section modulus about equal to that of the combination. However, tests which have been made of piling walls composed of such sections of different styles show a flexural strength only about equal to that of the separate sections. Correct theory also so indicates, due to the fact that the longitudinal shear is so much greater than the frictional or other resistance of the interlock. Data regarding this subject will be furnished on request.

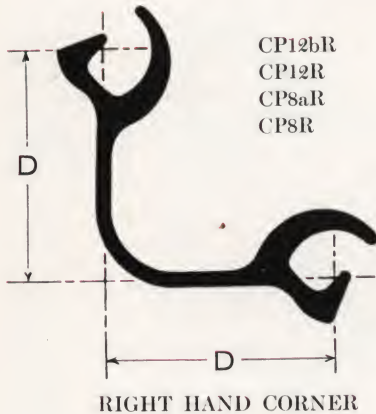
STANDARD HANDLING HOLES

Lackawanna Steel Sheet Piling sections will be furnished with standard handling holes as follows:

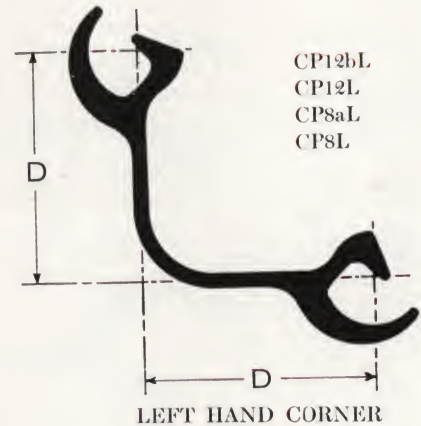
Sections No. SP8 and SP8a will be furnished with 1 $\frac{1}{2}$ inch handling hole 5 inches from one end. All other sections will be furnished with 2 $\frac{1}{2}$ inch handling hole 9 inches from one end.



ROLLED CORNERS FOR LACKAWANNA STEEL SHEET PILING

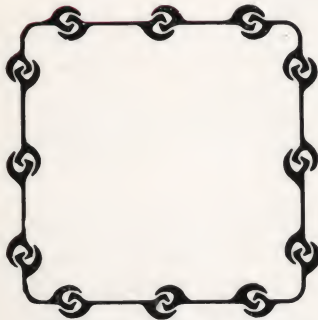


CP12bR
CP12R
CP8aR
CP8R

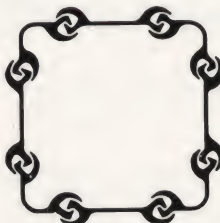


CP12bL
CP12L
CP8aL
CP8L

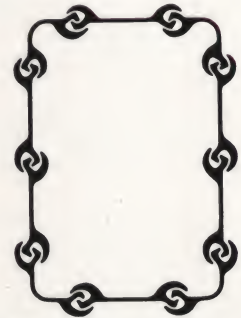
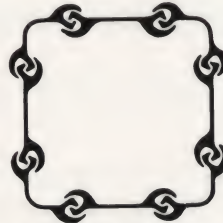
Number and Style of Rolled Corners Required For all sections except AP16.*



Cofferdams in which all four sides contain an even number of piles require two right hand and two left hand corners.



Cofferdams in which all four sides contain an odd number of piles require either four right hand corners or four left hand corners.



Cofferdams with two sides having an even number of piles and two sides having an odd number of piles require two right hand and two left hand corners.

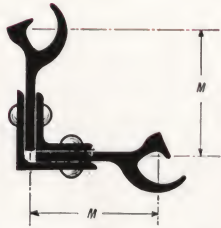
*NOTE—Section AP16, requires two right hand and two left hand corners for all rectangular cofferdams.

Appropriate Rolled Corners for Various Piling Sections

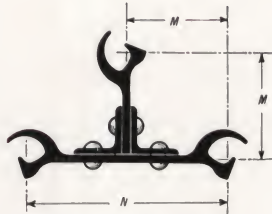
| FOR PLAIN PILING, SECTION NUMBER | ROLLED CORNERS Use Section Number | WEIGHTS AND DIMENSIONS | |
|-------------------------------------|---|----------------------------------|-----------------------|
| | | Weight, Pounds per Foot | DIMENSIONS, INCHES |
| | | | D |
| AP15 or SP12b | CP12bR or CP12bL | 40.9 | 6 $\frac{3}{8}$ |
| AP14, SP15 or SP12 | CP12R or CP12L | 37.2 | 6 $\frac{3}{8}$ |
| DP166, DP165, AP16, or SP8a | CP8aR or CP8aL | 17.8 | 4 $\frac{1}{4}$ |
| SP8 | CP8R or CP8L | 14.7 | 4 $\frac{1}{4}$ |



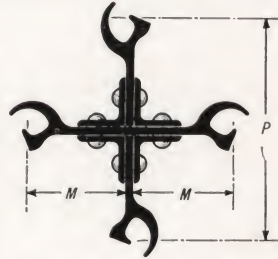
STANDARD FABRICATED CONNECTIONS FOR LACKAWANNA STEEL SHEET PILING



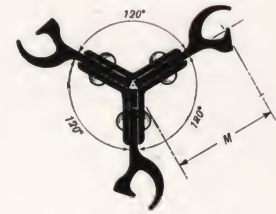
FABRICATED CORNER
FC12b
FC12
FC8a
FC8



FABRICATED TEE
FT12b
FT12
FT8a
FT8



FABRICATED CROSS
FX12b
FX12
FX8a
FX8



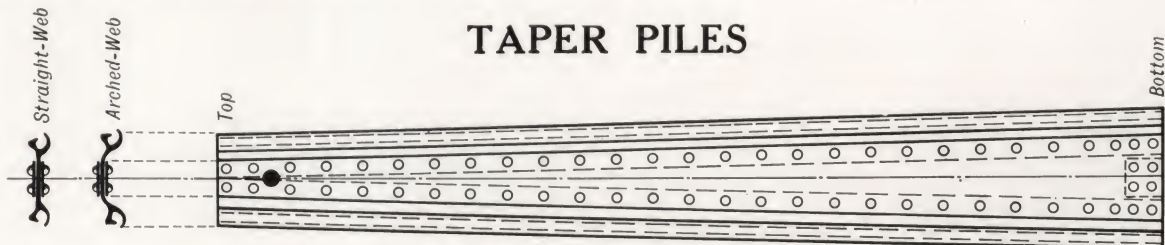
FABRICATED Y
FY12b
FY12
FY8a
FY8

APPROPRIATE STANDARD FABRICATED CONNECTIONS

FOR VARIOUS PILING SECTIONS

| FOR PLAIN PILING, SECTION NUMBER | WEIGHTS. AND DIMENSIONS | | | | | | | | | | |
|-------------------------------------|--------------------------|----------------------------------|--------------------------|----------------------------------|--------------------------|----------------------------------|--------------------------|----------------------------------|--------------------|-----|-----|
| | CORNERS | | TEES | | CROSSES | | Y's | | DIMENSIONS, INCHES | | |
| | Use Section Number | Weight, Pounds per Foot | Use Section Number | Weight, Pounds per Foot | Use Section Number | Weight, Pounds per Foot | Use Section Number | Weight, Pounds per Foot | M | N | P |
| AP15 or SP12b | FC12b | 59.7 | FT12b | 78.5 | FX12b | 113.8 | FY12b | 100.4 | 6⅜ | 12¾ | 13¼ |
| AP14, SP15 or SP12 | FC12 | 55.5 | FT12 | 72.1 | FX12 | 106.0 | FY12 | 94.8 | 6⅜ | 12¾ | 13⅛ |
| DP166, DP165, AP16, or SP8a | FC8a | 28.6 | FT8a | 35.8 | FX8a | 52.9 | FY8a | 63.9 | 4¼ | 8½ | 8¾ |
| SP8 | FC8 | 23.6 | FT8 | 29.6 | FX8 | 43.8 | FY8 | 59.1 | 4¼ | 8½ | 8¾ |

Deviations from the standard connections can be made when construction requires it. All connections are fabricated both ends alike, with handling holes; reversing the pile changes position of interlocks.



When piling walls are driven, one bar at a time, a tendency develops sometimes to lose distance at the bottom of wall. Taper Piles are used to correct this condition.

Taper Piles are fabricated by splitting standard piles longitudinally on center line of web and

joining them again by means of two tapered plates.

Taper piles are made of any of the Lackawanna Steel Sheet Piling sections. They are furnished with any spread required. Tops of taper piles are in all cases the same as pile section used.



BETHLEHEM STEEL COMPANY

BETHLEHEM STEEL COMPANY

General Offices

BETHLEHEM, PENNSYLVANIA

District Offices

| | |
|---------------------------|---------------------------------|
| ATLANTA | Healey Building |
| BALTIMORE | Continental Building |
| BOSTON | Atlantic National Bank Building |
| BUFFALO | Marine Trust Building |
| CHICAGO | People's Gas Building |
| CINCINNATI | Union Trust Building |
| CLEVELAND | Terminal Tower |
| DETROIT | New Penobscot Building |
| HONOLULU, T. H. | Castle and Cook Building |
| HOUSTON | Post Dispatch Building |
| LOS ANGELES | Pacific Finance Building |
| NEW YORK | Cunard Building |
| PHILADELPHIA | Widener Building |
| PITTSBURGH | Oliver Building |
| PORTLAND, ORE. | American Bank Building |
| ST. LOUIS | Arcade Building |
| SAN FRANCISCO | Matson Building |
| SEATTLE | L. C. Smith Building |
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BETHLEHEM STEEL EXPORT CORPORATION

25 BROADWAY, NEW YORK CITY

Sole Exporter of Our Commercial Products







